

REMARKS

The final Office Action dated August 27, 2002 and the cited references have been carefully considered. Claims 1-14 are pending. Claims 1-5 are rejected by the Examiner under 35 U.S.C § 102(b) as anticipated by, or in the alternative under 35 U.S.C. § 103(a) as obvious over Tajima (US patent 5,036,238; hereinafter "Tajima"). The Examiner indicated that Tajima disclosed all the elements of the claimed invention. The Examiner further stated that no patentable weight could be given to the method of manufacturing limitations in claims 1, 3 and 5. According to the Examiner, patentability of a product does not depend on its method of production. The Examiner accordingly stated that, if the product in a product-by-process claim is same or obvious from a product of the prior art, the claim is unpatentable, even though the product was made by a different process. The Examiner also stated that it would have been obvious at the time invention was made, to know that the spring in Tajima was capable of adjusting the position of the winding block under external forces such as centrifugal forces, thermal expansion and material ageing. The Examiner rejected claims 6-8 and claim 11 under 35 U.S.C. § 103(a) as being unpatentable over McCabria (US patent 4,409,502; hereinafter "McCabria"). According to the Examiner, it would have been obvious at the time invention was made to know that the winding block was movably detached from its position since the winding block is an individual piece being processed by centrifugal forces, which necessarily produce a displacement between of the block. The Examiner further stated that, no patentable weight could be given to the method of manufacturing limitations in claim 6. The Examiner rejected claims 9-10 and claims 12-13 under 35 U.S.C. § 103(a) as being unpatentable over McCabria in view of Tajima. According to the Examiner it would have been obvious at the time invention was made, to modify the multi-pole electric machine rotor assembly of McCabria and provide it with the winding block configuration disclosed by Tajima, for the purpose of utilizing the restoring forces of the elastic members and thereby holding field coils without causing any great change in the holding forces thereof even against any type of a dimensional change. The Examiner further stated that no patentable weight could be given to the method of

manufacturing limitations in claims 9-10 and claims 12-13. The Examiner rejected claim 14 under 35 U.S.C. § 103(a) as being unpatentable over McCabria in view of Kleeman (US patent 5,015,904; hereinafter "Kleeman"). According to the Examiner, it would have been made obvious at the time invention was made, to modify the multi-pole electric machine rotor assembly of McCabria and provide it with the winding block material disclosed by Kleeman for the purpose of improving reliability and performance of the electric machine.

Applicants respectfully traverse all of these rejections of claims 1-14 for the reasons set forth below.

Rejections Under 35 U.S.C. § 102(b)

Claims 1-5

Claims 1-5 are rejected by the Examiner under 35 U.S.C § 102(b) as anticipated by Tajima. According to the Examiner, Tajima disclosed all the elements of the claimed invention. The Examiner further stated that no patentable weight could be given to the method of manufacturing limitations in claims 1, 3 and 5. According to the Examiner, the patentability of a product does not depend on its method of production. Applicants respectfully traverse these rejections.

Anticipation cannot be found in a situation where the claimed elements are arranged differently in the prior art. Furthermore, it is error to "treat the claims as a mere catalog of separate parts, in disregard of the part-to-part relationships set forth in the claims . . . that give the claims their meanings." *Id.* at 486. Similarly, if the claim recites a function as a limitation, such a limitation cannot be met by an element in a reference that performs a different function, even though it may be part of a device embodying the same general overall concept. *RCA Corp. v. Applied Digital Data Systems, Inc.*, 221 U.S.P.Q. 385, 389, n.5 (Fed. Cir. 1984).

Tajima disclosed a rotor of a salient-pole type rotary machine, in which a coil brace and a holder is provided with an elastic member disposed between adjacent magnetic poles. Another elastic member is disposed, between the coil brace and the holder. A field coil fixing mechanism and the coil brace used by Tajima utilize the restoring forces of the elastic members and thereby hold field coils without causing any great change in the holding forces arising due to tightening of the bolt. Figure 2 of Tajima clearly illustrates the structural relationship of the elements arranged therein. The coil brace has a recess formed in the upper surface to insert a first spring therein and is centrally formed with a hole for insertion of a bolt. A spring holder is disposed above the coil brace. The first spring is mounted between the bottom of the recess of the coil brace and the bottom of the holder, while a second spring is mounted between a spring presser fitted on the bolt and the bottom of the recess of the spring holder (Column 2, Lines 45-65). Figure 3 disclosed by Tajima illustrates that the frictional force in a slant direction arises due to structural relationship of the coil brace and the magnetic pole with the tightening bolt and the spring.

Moving to the claimed invention, Applicants disclosed a removable self- locking field winding block. Figure 1 disclosed by the Applicants illustrates such winding block, disposed between a winding module and corresponding fins in each of the spaces between the pole faces and the fins. The winding block is movably detached from the fins and the winding module (Page 2, Lines 15-19). The winding blocks are not structurally interconnected to a tightening or pre-stressing arrangement to adjust the friction force, as disclosed by Tajima. The Examiner is requested to note that limitations of claims 1, 3 and 5 (i.e. "a winding block disposed in engagement with the winding module and shaped to be shifted to a final position relative to the winding module when the rotor assembly is rotated at about its rated speed thereby compressing the winding module") do not refer to method of manufacturing limitations as mentioned by the Examiner. On the other hand, part-to-part relationship set forth in the elements disclosed by the Applicants makes the apparatus perform its desired function, within overall scope of the claimed invention. Moreover, as discussed above in sufficient details, arrangement

of the elements in accordance with the claimed invention is significantly different from Tajima. Accordingly, mere overall similarity of elements between claimed invention and Tajima, does not render claim 1 to be anticipated from Tajima within scope of 35 U.S.C. § 102(b).

In accordance with reasons set forth above, Applicants respectfully submit that claim 1 is in full compliance with the requirements of 35 U.S.C §102(b). Withdrawal of rejection of claim1 under 35 U.S.C §102(b) is respectfully requested.

Claims 2-5 depend either directly or indirectly from independent claim 1 and are therefore believed to be allowable for the reasons stated above. Accordingly, withdrawal of the rejection of claims 2-5 under 35 U.S.C §102(b) is respectfully requested.

Rejections Under 35 U.S.C. § 103(a)

Claims 1-5

Claims 1-5 are rejected by the Examiner under 35 U.S.C. § 103(a) as obvious over Tajima. According to the Examiner, it would have been obvious at the time invention was made to know that the spring in Tajima was capable of adjusting the position of the winding block under external forces such as centrifugal forces, thermal expansion and material ageing. Applicants respectfully traverse these rejections.

"It is the invention as a whole that must be considered in obviousness determinations. The invention as a whole embraces the structure, its properties, and the problem it solves, [viewed in light of the teachings of the prior art]." *In re Wright*, 6 U.S.P.Q.2d 1959, 1961 (Fed. Cir. 1988). "The actual determination of the issue [under 35 U.S.C. § 103] requires an evaluation in the light of the findings in those inquiries of the obviousness of "the claimed invention as whole," not merely the differences between the claimed invention and the prior art." *Lear Siegler v. Aeroquip Corp.*, 221 U.S.P.Q. 1025, 1033 (Fed. Cir. 1984). Distilling the claims down to a one-word solution to a

problem is an improper application of 35 U.S.C. § 103. *Panduit Corp. v. Dennison Mfg. Co.*, 1 U.S.P.Q.2d 1593 (Fed. Cir. 1987). "A patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. This is part of the "subject matter as a whole," which should always be considered in determining the obviousness of an invention under 35 U.S.C. § 103." *In re Spinnoble*, 160 U.S.P.Q. 237, 243 (C.C.P.A. 1969).

Tajima disclosed a rotor of a salient-pole type rotary machine without the necessity of making adjustment and machining of the abutment surfaces of coil brace and coil brace insulator. The rotary machine has a built in correcting function for dimensional changes without additional tightening of bolts or re-adjustment after disassembling of the rotary machine and pulling out of the rotor. The dimensional changes are caused either due to secular ageing or thermal expansion of the field coils. Thus, the field coil fixing mechanism and coil brace disclosed by Tajima utilize restoring force of the elastic members without causing any great change in the holding forces thereof against any type of a dimensional change (Column 2, Lines 15-20). However, as illustrated in the structural relationship of the elements disclosed by Tajima, the elastic members cannot absorb the bending stress that may be generated for example due to different radial stiffness of the material the rotor material and the holding bolt material. Differential radial stiffness of the rotor and the holding mechanism may give rise to material fatigue which in turn causes pre-mature failure of the holding mechanism itself. As illustrated in the Figures and description of Tajima, failure of the holding mechanism renders the retaining mechanism also ineffective.

Moving to the claimed invention, Applicants disclosed a removable self- locking field winding block. Figure 1 disclosed by the Applicants illustrates such winding block, disposed between a winding module and corresponding fins in each of the spaces between the pole faces and the fins. The winding block is movably detached from the fins and the winding module (Page 2, Lines 15-19). The winding blocks are not structurally interconnected to a tightening or pre-stressing arrangement to adjust the

friction force, as disclosed by Tajima. The Examiner is requested to note that limitations of claims 1, 3 and 5 (i.e. "a winding block disposed in engagement with the winding module and shaped to be shifted to a final position relative to the winding module when the rotor assembly is rotated at about its rated speed thereby compressing the winding module") do not refer to method of manufacturing limitations as mentioned by the Examiner. On the other hand, part-to-part relationship set forth in the elements disclosed by the Applicants makes the apparatus perform its desired function, within overall scope of the claimed invention. Accordingly, it will be improper to conclude that claim 1 is unpatentable based on the product itself in isolation, without paying attention to the functional requirement of the product.

In accordance with reasons set forth above, Applicants respectfully submit that claim 1 is in full compliance with the requirements of 35 U.S.C §103(a). Withdrawal of rejection of claim 1 under 35 U.S.C §103(a) is respectfully requested.

Claims 2-5 depend either directly or indirectly from independent claim 1 and are therefore believed to be allowable for the reasons stated above. Accordingly, withdrawal of the rejection of claims 2-5 under 35 U.S.C §103(a) is respectfully requested.

Claims 6-8 and 11

Claims 6-8 and claim 11 are rejected by the Examiner under 35 U.S.C. § 103(a) as being unpatentable over McCabria. According to the Examiner, it would have been obvious at the time invention was made to know that the winding block was movably detached from its position, since the winding block is an individual piece being processed by centrifugal forces, which necessarily produce a displacement between of the block. The Examiner further stated that no patentable weight could be given to the method of manufacturing limitations in claim 6. The Examiner stated that even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. According to the Examiner, the patentability of a product does not depend on its method of production. If the product in the product by process

claim is the same or obvious from a product, the claim is unpatentable even though the prior product was made by a different process. Applicants respectfully traverse these rejections.

"It is the invention as a whole that must be considered in obviousness determinations. The invention as a whole embraces the structure, its properties, and the problem it solves, [viewed in light of the teachings of the prior art]." *In re Wright*, 6 U.S.P.Q.2d 1959, 1961 (Fed. Cir. 1988). "The actual determination of the issue [under 35 U.S.C. § 103] requires an evaluation in the light of the findings in those inquiries of the obviousness of "the claimed invention as whole," not merely the differences between the claimed invention and the prior art." *Lear Siegler v. Aeroquip Corp.*, 221 U.S.P.Q. 1025, 1033 (Fed. Cir. 1984). Distilling the claims down to a one-word solution to a problem is an improper application of 35 U.S.C. § 103. *Panduit Corp. v. Dennison Mfg. Co.*, 1 U.S.P.Q.2d 1593 (Fed. Cir. 1987). "A patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. This is part of the "subject matter as a whole," which should always be considered in determining the obviousness of an invention under 35 U.S.C. § 103." *In re Spinnoble*, 160 U.S.P.Q. 237, 243 (C.C.P.A. 1969).

McCarbia disclosed a method for improving circulation of cooling gas through the structure of rotary electrical machines. Additional cooling passages are provided by a gap between the rotor and stator of the rotary electrical machine and by axial stator cooling passages in the stator assembly. These passages receive air expelled from A-shaped wedges at the center of the rotor. The air is expelled through apertures in the wedge. Figure 6 of McCarbia illustrates a cross-sectional view of the inter-polar space between two poles of a salient pole rotor. The wedge comprises circumferentially disposed surface, which are arranged to form the sides of axial rotor cooling passage. The wedge is shown to be in intimate thermal contact with rotor windings. Aperture of wedge extends through wedge retainer to pass coolant out of wedge (Column 3, Lines 60-

69; Column 4, Lines 1-4). Additionally, the wedge retainer provides structural support to the wedge.

Moving to the claimed invention, Applicants disclosed a removable self- locking field winding block. Figure 1 disclosed by the Applicants illustrates such winding block, disposed between a winding module and corresponding fins in each of the spaces between the pole faces and the fins. The winding block is movably detached from the fins and the winding module (Page 2, Lines 15-19). The winding blocks are not structurally interconnected to a tightening or pre-stressing arrangement to adjust the friction force, as disclosed by Tajima. The Examiner is requested to note that limitations of claim 6 (i.e “the winding block being disposed in an initial engagement position with the winding module, the winding block being shaped to be shifted radially outward from the initial engagement position to a final position relative to the winding module when the rotor assembly is rotated at about its rated speed thereby compressing the winding module”) do not refer to method of manufacturing limitations as mentioned by the Examiner. On the other hand, part-to-part relationship set forth in the elements disclosed by the Applicants, makes the apparatus perform its desired function within overall scope of the claimed invention. Accordingly, it will be improper to conclude that the claim 6 is unpatentable, based on the product itself in isolation, without paying attention to the functional requirement of the product. An in depth analysis of actual determination of issue in the light of findings of McCarbia, clearly suggests that McCarbia teaches away from the claimed invention. Accordingly, mere similarity in shape and structure of some of the elements of the claimed invention with the prior art does not render claim 6 obvious within scope of 35 U.S.C. § 103(a).

In accordance with reasons set forth above, Applicants respectfully submit that claim 6 is in full compliance with the requirements of 35 U.S.C §103(a). Withdrawal of rejection of claim 6 under 35 U.S.C §103(a) is respectfully requested.

Claims 7-8 and claim 11 depend either directly or indirectly from independent claim 6 and are therefore believed to be allowable for the reasons stated above.

Accordingly, withdrawal of the rejection of claims 7-8 and claim 11 under 35 U.S.C §103(a) is respectfully requested.

Claims 9-10, 12 and 13

Claims 9-10 and claims 12-13 are rejected by the Examiner under 35 U.S.C. § 103(a) as being unpatentable over McCabria in view of Tajima. According to the Examiner, it would have been obvious at the time invention was made, to modify the multi-pole electric machine rotor assembly of McCabria and provide it with the winding block configuration disclosed by Tajima for the purpose of utilizing the restoring forces of the elastic members and thereby holding field coils without causing any great change in the holding forces thereof even against any type of a dimensional change. The Examiner further stated that no patentable weight could be given to the method of manufacturing limitations in claims 9-10 and claims 12-13. The Examiner stated that even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. According to the Examiner, the patentability of a product does not depend on its method of production. If the product in the product by process claim is the same or obvious from a product, the claim is unpatentable even though the prior product was made by a different process. Applicants respectfully traverse these rejections.

"In order to rely on a reference as a basis for rejection of an applicant's invention [under 35 U.S.C. § 103], the reference must be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 24 U.S.P.Q.2d 1443, 1445 (Fed. Cir. 1991).

"It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious. "One cannot use hindsight reconstruction to pick and choose among

isolated disclosures in the prior art to deprecate the claimed invention." *In re Fritch*, 23 U.S.P.Q.2d 1780, 1784 (Fed. Cir. 1992).

"To imbue one of ordinary skill in the art with knowledge of the invention, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 220 U.S.P.Q. 303, 312-13 (Fed. Cir. 1983).

McCarbia disclosed a method for improving circulation of cooling gas through the structure of rotary electrical machines. Additional cooling passages are provided by a gap between the rotor and stator of the rotary electrical machine and by axial stator cooling passages in the stator assembly. These passages receive air expelled from A-shaped wedges at the center of the rotor. The air is expelled through apertures in the wedge. Figure 6 of McCarbia illustrates a cross-sectional view of the inter-polar space between two poles of a salient pole rotor. The wedge comprises circumferentially disposed surface, which are arranged to form the sides of axial rotor cooling passage. The wedge is shown to be in intimate thermal contact with rotor windings. Aperture of wedge extends through wedge retainer to pass coolant out of wedge (Column 3, Lines 60-69; Column 4, Lines 1-4). Additionally, the wedge retainer provides structural support to the wedge.

Tajima disclosed a rotor of a salient-pole type rotary machine without the necessity of making adjustment and machining of the abutment surfaces of coil brace and coil brace insulator. The rotary machine has a built in correcting function for dimensional changes without additional tightening of bolts or re-adjustment after disassembling of the rotary machine and pulling out of the rotor. The dimensional changes are caused either due to secular ageing or thermal expansion of the field coils. Thus, the field coil fixing mechanism and coil brace disclosed by Tajima utilize restoring force of the elastic members without causing any great change in the holding forces

thereof against any type of a dimensional change (Column 2, Lines 15-20). However, as illustrated in the structural relationship of the elements disclosed by Tajima, the elastic members cannot absorb the bending stress that may be generated for example due to different radial stiffness of the material the rotor material and the holding bolt material. Differential radial stiffness of the rotor and the holding mechanism may give rise to material fatigue which in turn causes pre-mature failure of the holding mechanism itself. As illustrated in the Figures and description of Tajima, failure of the holding mechanism renders the retaining mechanism also ineffective.

Moving to the claimed invention, Applicants disclosed a removable self- locking field winding block. Figure 1 disclosed by the Applicants illustrates such winding block, disposed between a winding module and corresponding fins in each of the spaces between the pole faces and the fins. The winding block is movably detached from the fins and the winding module (Page 2, Lines 15-19). The winding blocks are not structurally interconnected to a tightening or pre-stressing arrangement to adjust the friction force, as disclosed by Tajima. The Examiner is requested to note that limitations of claims 9, 10, 12-13 (for example "the winding block is shifted to a final position relative to the winding module when the rotor assembly rotates at about its rated speed" in claim 9) does not refer to method of manufacturing limitations as mentioned by the Examiner. On the other hand, part-to-part relationship set forth in the elements disclosed by the Applicants makes the apparatus perform its desired function within overall scope of the claimed invention. Accordingly, it will be improper to conclude that the claims 9, 10, 12-13 are unpatentable based on the product itself in isolation, without paying attention to the desired functional requirement of the product.

An in depth analysis of whether the particular problem with which the inventor was concerned is pertinent in the light of findings of McCarbia and Tajima, clearly suggests the lack of rationale for combining teachings of McCarbia with Tajima. Accordingly, it would be improper to conclude that the claims 9-10, 12 and 13 are unpatentable over McCarbia in view of Tajima.

In accordance with reasons set forth above, Applicants respectfully submit that claims 9-10, 12 and 13 are in full compliance with the requirements of 35 U.S.C §103(a). Withdrawal of rejection of claims 9-10, 12 and 13 under 35 U.S.C §103(a) is respectfully requested.

Claim 14

Claim 14 is rejected by the Examiner under 35 U.S.C. § 103(a) as being unpatentable over McCabria in view of Kleeman. According to the Examiner, it would have been made obvious at the time invention was made, to modify the multi-pole electric machine rotor assembly of McCabria and provide it with the winding block material disclosed by Kleeman for the purpose of improving reliability and performance of the electric machine. Applicants respectfully traverse these rejections.

"In order to rely on a reference as a basis for rejection of an applicant's invention [under 35 U.S.C. § 103], the reference must be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 24 U.S.P.Q.2d 1443, 1445 (Fed. Cir. 1991).

"It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious. "One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." *In re Fritch*, 23 U.S.P.Q.2d 1780, 1784 (Fed. Cir. 1992).

"To imbue one of ordinary skill in the art with knowledge of the invention, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 220 U.S.P.Q. 303, 312-13 (Fed. Cir. 1983).

Kleeman disclosed a stator of an electrical machine in which it is possible to produce a main winding of non-insulated flat wire and a shunt winding of insulated round wire in an automated process. Accordingly Kleeman taught that the individual windings of the shunt winding and their contact parts to be arranged continuously on a common winding support fabricated from a flat flexible insulating band-like material. The shunt winding is held, by baking, fixed in its position on the winding support of flat and flexible insulating band-like material, and the contact parts for the voltage connection are located on the winding support so that the winding ends can be attached there to them. In addition, the winding support carrying the shunt winding surrounds the winding from outside or inside and can be arranged in the pole housing itself (Column 1, Lines 40-60).

McCarbia disclosed a method for improving circulation of cooling gas through the structure of rotary electrical machines. Additional cooling passages are provided by a gap between the rotor and stator of the rotary electrical machine and by axial stator cooling passages in the stator assembly. These passages receive air expelled from the A-shaped wedges at the center of the rotor. The air is expelled through apertures in the wedge. Figure 6 of McCarbia illustrates a cross-sectional view of the inter-polar space between two poles of salient pole rotor. The wedge comprises circumferentially disposed surface, which are arranged to form the sides of axial rotor cooling passage. The wedge is shown to be in intimate thermal contact with rotor windings. Aperture of wedge extends through wedge retainer to pass coolant out of wedge (Column 3, Lines 60-69; Column 4, Lines 1-4). Moving to the claimed invention, Applicants accordingly disclosed a method for winding blocking system that effects a locked position of the winding blocks. As the rotor spin speed increases during operation winding blocks are shifted radially outwards by centrifugal force locking in their final position at or slightly above its rated speed. The parameters of the winding block such as angle of the tapered surface, friction co-efficient and the length of the block are engineered to achieve desired result. Accordingly, the winding block can create adequate pre-stress to retain the winding and provide a well defined referenced position preventing peripheral dissymmetry of the rotor.

An in depth analysis of whether the particular problem with which the inventor was concerned is pertinent in the light of findings of McCarbia and Kleeman, clearly suggests the lack of rationale for combining teachings of McCarbia with Kleeman. Accordingly, it would be improper to conclude that the claim 14 is unpatentable over McCarbia in view of Kleeman.

In accordance with reasons set forth above, Applicants respectfully submit that claim 14 is in full compliance with the requirements of 35 U.S.C §103(a). Withdrawal of rejection of claim 14 under 35 U.S.C §103(a) is respectfully requested.

Conclusion

In view of the remarks set forth above, allowance of the pending claims is respectfully requested. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Date: _____

11/11/02

Respectfully submitted,



General Electric Company
Building K1, Room
Schenectady, New York 12301

518-387-5206